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of Peninsular Florida

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## The Taxonomic Status of the Newts, *Diemictylus viridescens*, of Peninsular Florida

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Recent collecting in southern Florida by the senior author has revealed that there are locally abundant populations of the newt, *Diemictylus viridescens*. During the past year over eight hundred specimens were collected from four southern counties. This material, added to that already in the collections of the Museum of Zoology at the University of Michigan, is the basis for the description of a new race, which we shall call

### *Diemictylus viridescens piaropicola* subsp. nov.

*Holotype.* University of Michigan Museum of Zoology, No. 106333, an adult female from 5.2 miles east of Monroe Station, Collier County, Florida, collected by Albert Schwartz, L. Neil Bell, and Thomas M. Raymond, on April 18, 1952.

*Paratypes.* University of Michigan Museum of Zoology, No. 106334-106352, eleven females and eight males with the same data as the holotype.

*Diagnosis.* A dark race of *D. viridescens* with ventral surfaces heavily spotted; dorsum black; skin rough and spiny; head large; greater in length than *louisianensis* and lesser than *viridescens*.

*Geographic Distribution.* Peninsular Florida from the latitude of Osceola county south. Known from Citrus, Osceola, Sarasota, Hendry, Monroe, Collier, and Dade counties in central and southern Florida. Intergradation with *D. v. louisianensis* is known to occur in Alachua and Levy counties (Fig. 1).

*Description of Holotype.* An adult female with a total length of 99.0 mm. and a snout-vent length of 46.6 mm. The tail length is 53 per cent of the total length. The distance between the tip of the snout and the postero-lateral margin of the head is 13.1 mm. The width of the head at the widest point is 9.4 mm. The limbs are well developed, and when they are adpressed, they overlap by the length of the hind foot. The cranial ridges are flat and converge anteriorly just behind the nares and posteriorly just behind the orbits. There is a distinct gular fold. The vomero-palatine teeth

are in two narrowly separated, long rows. These converge between the elliptical internal nares.

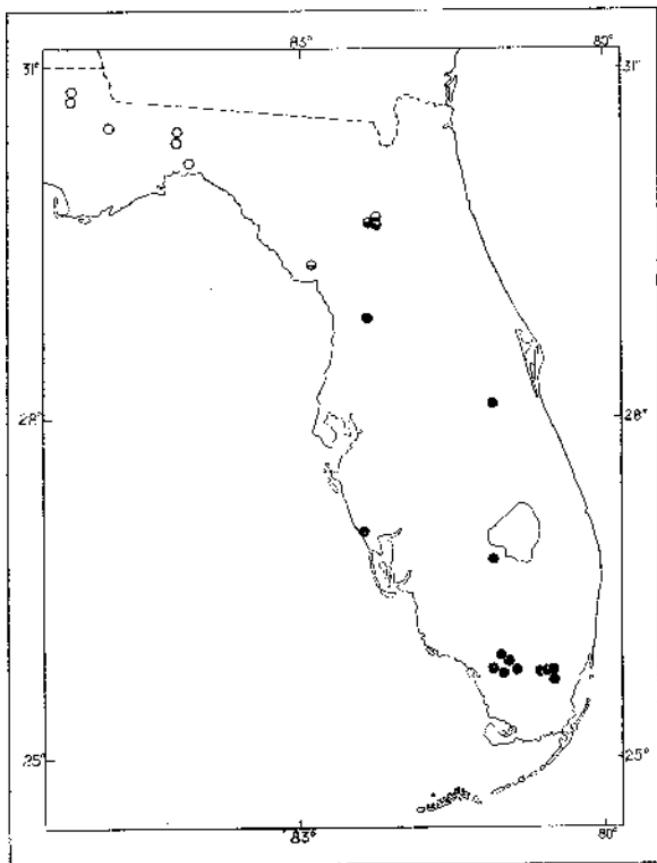


Figure 1. Map showing the distribution of the races of *Diemictylus viridescens* in peninsular Florida. Solid dots—*piaropicola*; open circles—*louisianensis*; semi-solid circles—*piaropicola x louisianensis*.

In preservative, dorsum uniformly Fuscous-Black (all capitalized color names are from Ridgway, 1912) from the snout through the lower margin of the eye, thence posterior along a line of demarcation extending from the upper insertion of front and hind limbs and the upper half of the tail. Upper surface of front and hind limbs and upper surface of digits Fuscous-Black. Ventral surface of body, chin, and throat Buff-Yellow, heavily overlain with spots of Fuscous-Black, especially on abdomen, and less so on throat. Ventral surface of forelimbs Buff-Yellow, heavily mottled with black spots, and becoming increasingly more clouded with Fuscous-Black on lower forelimb and foot. Ventral surface of hindlimbs

likewise Buff-Yellow and mottled with spots of Fuscous-Black. Plantar surface of hind foot and digits Fuscous-Black. Lips of cloaca Buff-Yellow, shading gradually into Deep Quaker Drab on ventral half of tail. A narrow midventral line of Buff-Yellow beginning on tail about 3 mm. behind cloacal protuberance and continuing for about one half length of tail, gradually blending into color of ventral caudal fin. Margin of ventral fin lighter than margin of dorsal fin; consequently mottling more apparent on ventral than on dorsal caudal fin. Cheek Buff-Yellow ventrally from a more heavily pigmented line of Fuscous-Black through center of eye. Upper lip strongly clouded with Fuscous-Black, lower lip less strongly so, and grading abruptly into Buff-Yellow on chin and throat.

*Variation.* The variation in size of forty adult specimens (20 males and 20 females) from the type locality and from 20.1 miles west of Miami, Dade County, is shown in Table 1.

**Table 1. Measurements of forty specimens of *Diemictylus viridescens piaropicola* from Dade and Collier counties, Florida.**

	Total Length	Snout-Vent Length	Tail/Total	Head Length	Head Width
Mean	88.27	41.37	53.12	11.54	8.17
Range	80.0-103.0	37.4-45.5	50.5-55.9	11.1-12.4	7.3-8.8
9 Mean	91.50	43.48	52.45	11.92	8.52
9 Range	79.0-104.0	37.2-47.3	48.2-54.7	11.0-13.2	7.6-9.4

The females average slightly larger than males, and the proportions are similar. The percentage of head width of head length is 70.79 in males and 71.48 in females. The percentage of head length of snout-vent length is 27.89 in males and 27.41 in females. There is very little variation in the cranial ridges, and the vomero-palatine teeth follow the same pattern in all of the adults examined. The very rough skin is characteristic of all adults. The only external characters indicating sexual dimorphism are the swollen cloacal protuberance of the males and the presence of three facial pits on each side of the head behind the eyes in the males.

Nineteen paratypes show the following variation in color when compared with the holotype. All resemble the holotype in dorsal coloration and dark upper lip. The degree of ventral spotting is quite variable; however, when compared with a series of three adults from Pearl River, St. Tammany Parish, Louisiana (which is close to the type locality of *louisianensis*) the paratypes of *piaropicola* have consistently less ventral spotting than *louisianensis*. The ventral maculations may be small, of a more or less uniform size, and very numerous, thus giving the abdomen a grayish cast; or the spots may be larger and more scattered over the venter, in which case more of the yellowish ground color is visible.

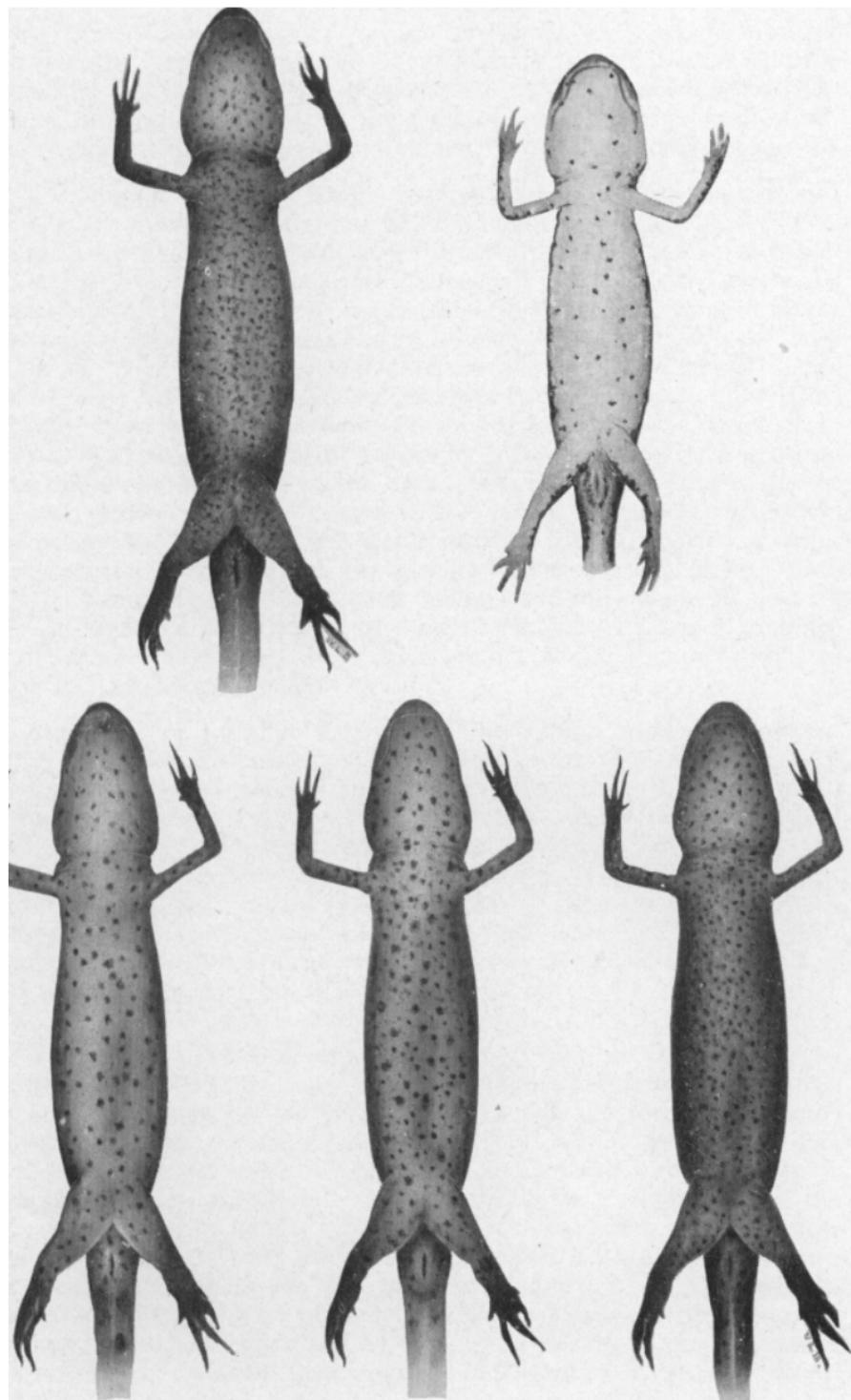
## PLATE 1

**Figure 1. (Upper) Comparison of the ventral coloration of**  
*Diemictylus viridescens piaropicola* **and** *D. v. louisianensis*.

**Left:** *piaropicola*, type specimen, UMMZ 106333.  
**Right:** *louisianensis*; **UMMZ 90060** from St. Tammany Parish, Louisiana.

**Figure 2. (Lower) Variation in ventral coloration of three**  
**paratypes of** *Diemictylus viridescens piaropicola*.

**Left to right:** UMMZ No. 106351, 106348, and  
106350.



Even in this instance where the dots are more scattered than in the holotype, the number of spots is not so great as in *louisianensis*, and the size of the dots always exceeds the very small maculations of the Louisiana newt. The ventral coloration of the paratypic series varies from the Buff-Yellow of the type to Chamois and Honey Yellow. (See Plate 1, Figure 2.)

The authors have been unable to find a terrestrial eft stage of this salamander. Several larvae from Dade County were examined. These can easily be divided into two groups; those with a well developed caudal fin, and those lacking a caudal fin. Nine small individuals having caudal fins average 49.7 mm. in total length (40.0-54.0) and 23.7 mm. in snout-vent length (19.0-27.0). Six larger individuals have an average total length of 59.33 mm. (55.0-63.0) and snout-vent length of 29.0 mm. (26.0-32.0). All of these individuals have well developed gills. Dorsally, the color varies from Olive-Brown in the smallest individuals to Fuscous-Black in the largest. In the lighter individuals the dorsal spotting is far more apparent than in the dark adults; this is, of course, due to the light ground color. In regard to the venter, the larvae require no comment other than that the dark-spotted condition, typical of adult *piaropiccola*, is well developed and is quite as characteristic in the young as in the adults. The ground color of the belly and the amount of spotting vary in much the same degree as these characteristics do in the adults. In the smaller individuals the skin is smooth, but in those 50 mm. or larger the skin becomes rough.

A number of neotenic individuals was found. Twelve males and eighteen females possessing gills or gill rudiments were examined. All have well developed gonads, and three of the females are laden with ovarian eggs. In this series the males have an average total length of 73.0 mm. (66.0-82.0) and a snout-vent length of 34.88 mm. (30.0-39.0). The females have an average total length of 70.66 mm. (60.0-96.0) and snout-vent length of 34.22 mm. (29.0-46.0). All of these specimens exhibit the typical adult coloration of a heavily spotted venter and Fuscous-Black dorsum. One small individual with a snout-vent length of 24.0 mm. is of typical adult coloration, but is sexually immature.

*Comparisons.* The most striking differences between *D. v. piaropiccola* and *louisianensis* are the much darker (more blackish) dorsal coloration and the much more heavily pigmented venter in the former. As noted above, *piaropiccola* does not have such scanty ventral spotting as does *louisianensis*. In three near-topotypes of *louisianensis*, the upper lip is clear or almost so, with very little clouding by the dorsal color; on the lighter ground color of the lip, the dark scattered spots are quite clear and well defined. In *piaropiccola*, the upper lip is distinctly clouded with the dorsal color, and the maculations are very indistinct and obscured. In size, the mean total length of twenty male *piaropiccola* is 88.27 mm., and the mean snout-vent length is 41.37 mm. In a series of ten breeding males of *louisianensis* the mean total length is 77.95 mm. and the mean snout-

vent length is 36.26 mm. Twenty female *piaropiccola* have a mean total length of 91.50 mm., and a mean snout-vent length of 43.48 mm., while in a series of ten female *louisianensis*, the mean total length is 84.90 mm., and the mean snout-vent length is 40.80 mm. In this regard, Bishop (1943) states that the adults of *D. v. louisianensis* vary from 65-89 mm. in total length. ( See Plate 1, Figure 1.)

Specimens from Gainesville and surrounding areas in Alachua County, and also specimens from near Rosewood in Levy County, display characteristics intermediate between those of *piaropiccola* and *louisianensis*. They are darker dorsally than are typical *louisianensis*, and they show heavier spotting of the ventral surfaces than do *louisianensis* from western Florida, Alabama, and Louisiana.

One specimen from near Marianna, Jackson County, Florida, and two specimens from near Silver Lake, Wakulla County, Florida, show an unusually high number of belly spots for *louisianensis*. It is possible that further collecting in critical areas in northwestern Florida will show that the area of intergradation extends into the region.

*Remarks.* Collecting the series of *D. v. piaropiccola* in southern Florida was accomplished by removing masses of water hyacinths (*Piaro pus crassipes*) from side canals and sloughs along the Tamiami Trail. The hyacinth inhabiting propensity of these newts is alluded to in the sub-specific name. Although in Dade County these salamanders were taken from the hyacinth-choked canals and sloughs, in Collier and Monroe counties—including the type locality—large numbers of newts were found living in masses of submerged aquatic vegetation in cypress-margined ponds. At the locality in Hendry County, the newts were taken from the roots of water lettuce (*Pistia stratiotes*) in the canal paralleling the road to Moorehaven. Here they seemed not quite so abundant as further to the south. The occurrence of these amphibians in cypress ponds gives a clue to their original habitat in southern Florida before the introduction of the water hyacinth. Although they were the only salamanders taken in the cypress ponds, in the stagnant sloughs they were accompanied by *Amphiuma means* and *Siren lacertina*.

Several adults were taken by Raymond P. Porter, beneath the pile of grasses and sedges which make up the lodge of the water rat (*Neo fiber alleni struix*). These adults were taken beneath the building material on the dry muck substrate when the surrounding 'glades were dry during the summer. The scattered lodges of *Neo fiber* would seem to be a likely place for efts to occur, yet they have not been taken either in the lodges or elsewhere in the southern portion of the Florida Peninsula.

*Specimens Examined.* 941 as follows, all from Florida. (UMMZ refers to the University of Michigan Museum of Zoology; UMRC refers to the Reference Collection of the University of Miami.)

**D. v. louisianensis:** Jackson Co.—Marianna 4 (UMMZ 68853, 73982, 95567); 2.7 mi. S Marianna, 1 (UMMZ 105994); Liberty Co.—Camp, Torrea, 1 (UMMZ 74435); Leon Co.—Tallahassee, 2 (UMMZ 63080); 7.8 mi. S Tallahassee, 17 (UMMZ 105995); no other locality, 3 (UMMZ 56705-7); Alachua Co.—Gainesville (?), 1 (UMMZ 74436)

**D. v. piaropicola:** Citrus Co.—3.6 mi. E Inverness, 1 (UMMZ 106353); Osceola Co.— $\frac{1}{2}$  mi. S Holopaw, 1 (UMMZ 102375); Sarasota Co.—Englewood, 4 (UMMZ 80518); Hendry Co.—4.8 mi. S Moorehaven, 63 (UMMZ 106045, 106053, 106060); Collier Co.—5.2 mi. E Monroe Station, 85 (UMMZ 106044, 106333-52); Tamiami Trail, 2.3 mi. W Collier-Dade county line, 5 (UMMZ 106052); Monroe Co.—Pinecrest, 1 (UMRC 51.17); 5.4 mi. S Monroe Station, 20 (UMMZ 106051); Dade Co.—Tamiami Trail, 3.5 mi. SE Dade-Collier county line, 7 (UMMZ 106050); 19 mi. W, 3 mi. S Miami, 5 (UMMZ 106058); 20.1 mi. W Miami, 413 (UMMZ 106046, 106048, 106049, 106055; UMRC 51.462, 51.463); 20.6 mi. W Miami, 26 (UMMZ 106056); 21 mi. W Miami, 3 (UMMZ 103825); 21.2 mi. W Miami, 47 (UMMZ 106047; UMRC 51.461); 22 mi. W Miami, 37 (UMMZ 106054); 23.1 mi. W Miami, 176 (UMMZ 106059; UMRC 51.465).

Intergrades between *D. v. louisianensis* and *D. v. piaropicola*: Alachua Co.—Gainesville, 6 (UMMZ 56543, 73983); 6 mi. SW Gainesville, 6 (UMMZ 578245, 57827, 57814-5, 57832); Payne's Prairie, 2 (UMMZ 74438); near Payne's Prairie, 2 (UMMZ 77164-5); no other locality, 1 (UMMZ 57836); Levy Co.—2.5 mi. NE Rosewood, 2 (UMMZ 100697).

Specimens from Louisiana, Mississippi, and Alabama (all referable to *D. v. louisianensis*) are not listed with the specimens examined.

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